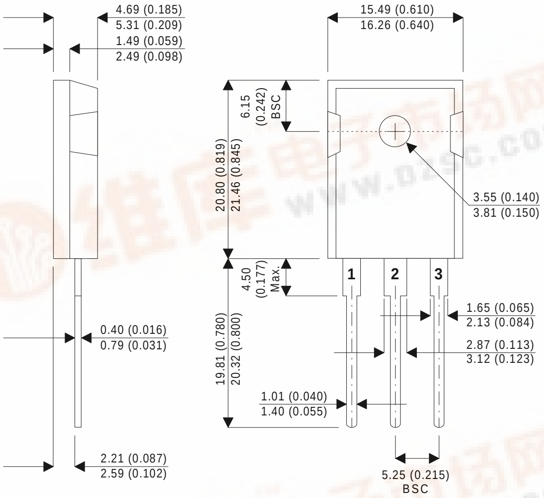
SEME LAB

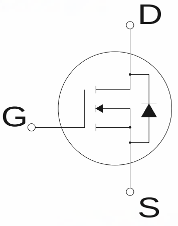
SML80B13

TO–247AD Package Outline.

Dimensions in mm (inches)



Pin 1 – Gate **Pin 2 – Drain** **Pin 3 – Source**



N–CHANNEL ENHANCEMENT MODE HIGH VOLTAGE POWER MOSFETS

V_{DSS}	**800V**
$I_{D(cont)}$	**13A**
$R_{DS(on)}$	**0.650Ω**

- **Faster Switching**
- **Lower Leakage**
- **100% Avalanche Tested**
- **Popular TO–247 Package**

StarMOS is a new generation of high voltage N–Channel enhancement mode power MOSFETs. This new technology minimises the JFET effect, increases packing density and reduces the on-resistance. StarMOS also achieves faster switching speeds through optimised gate layout.

ABSOLUTE MAXIMUM RATINGS (T$_{case}$ = 25°C unless otherwise stated)

V_{DSS}	Drain – Source Voltage	800	V
I_D	Continuous Drain Current	13	A
I_{DM}	Pulsed Drain Current [1]	52	A
V_{GS}	Gate – Source Voltage	±30	V
V_{GSM}	Gate – Source Voltage Transient	±40	
P_D	Total Power Dissipation @ T_{case} = 25°C	280	W
	Derate Linearly	2.24	W/°C
T_J , T_{STG}	Operating and Storage Junction Temperature Range	–55 to 150	°C
T_L	Lead Temperature : 0.063” from Case for 10 Sec.	300	
I_{AR}	Avalanche Current[1] (Repetitive and Non-Repetitive)	13	A
E_{AR}	Repetitive Avalanche Energy [1]	30	mJ
E_{AS}	Single Pulse Avalanche Energy [2]	1210	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.

2) Starting T_J = 25°C, L = mH, R_G = 25Ω, Peak I_L = 13A

STATIC ELECTRICAL RATINGS (T_{case} = 25°C unless otherwise stated)

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain – Source Breakdown Voltage	$V_{GS} = 0V$, $I_D = 250\mu A$	800			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = V_{DSS}$			25	μA
	($V_{GS} = 0V$)	$V_{DS} = 0.8V_{DSS}$, $T_C = 125°C$			250	
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30V$, $V_{DS} = 0V$			±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 1.0mA$	2		4	V
$I_{D(ON)}$	On State Drain Current [2]	$V_{DS} > I_{D(ON)} \times R_{DS(ON)}$ Max $V_{GS} = 10V$	13			A
$R_{DS(ON)}$	Drain – Source On State Resistance [2]	$V_{GS} = 10V$, $I_D = 0.5\ I_D$ [Cont.]			0.65	Ω

DYNAMIC CHARACTERISTICS

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0V$		3050		pF
C_{oss}	Output Capacitance	$V_{DS} = 25V$		300		
C_{rss}	Reverse Transfer Capacitance	f = 1MHz		140		
Q_g	Total Gate Charge[3]	$V_{GS} = 10V$		150		nC
Q_{gs}	Gate – Source Charge	$V_{DD} = 0.5\ V_{DSS}$		17		
Q_{gd}	Gate – Drain (“Miller”) Charge	$I_D = I_D$ [Cont.] @ 25°C		78		
$t_{d(on)}$	Turn–on Delay Time	$V_{GS} = 15V$		12		ns
t_r	Rise Time	$V_{DD} = 0.5\ V_{DSS}$		11		
$t_{d(off)}$	Turn-off Delay Time	$I_D = I_D$ [Cont.] @ 25°C		60		
t_f	Fall Time	$R_G = 1.6\Omega$		12		

SOURCE – DRAIN DIODE RATINGS AND CHARACTERISTICS

	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	(Body Diode)			13	A
I_{SM}	Pulsed Source Current[1]	(Body Diode)			52	
V_{SD}	Diode Forward Voltage[2]	$V_{GS} = 0V$, $I_S = -I_D$ [Cont.]			1.3	V
t_{rr}	Reverse Recovery Time	$I_S = -I_D$ [Cont.] , $dI_S / dt = 100A/\mu s$		650		ns
Q_{rr}	Reverse Recovery Charge	$I_S = -I_D$ [Cont.] , $dI_S / dt = 100A/\mu s$		9		μC

THERMAL CHARACTERISTICS

	Characteristic	Min.	Typ.	Max.	Unit
$R_{\theta JC}$	Junction to Case			0.45	°C/W
$R_{\theta JA}$	Junction to Ambient			40	

1) Repetitive Rating: Pulse Width limited by maximum junction temperature.
2) Pulse Test: Pulse Width < 380μS , Duty Cycle < 2%
3) See MIL–STD–750 Method 3471

CAUTION — Electrostatic Sensitive Devices. Anti-Static Procedures Must Be Followed.